Center Activities: Helmholtz-Zentrum Dresden-Rossendorf

Andreas Wagner

HZDR Facts and Figures

Member of the **Helmholtz Association** since 2011

Foundation **1956 (former GDR) / 1992**

Employees **approx. 800**
including about 260 scientists
+ 130 doctoral students and guest scientists from **40+** countries

Research Sites

DRESDEN
Leipzig (isotope research)
Freiberg (resource technologies)
Grenoble (ESRF beam line)

Local Partners

TU and U-Hospital Dresden

OncoRay (ZIK) National Center for Radiation Research in Oncology Dresden

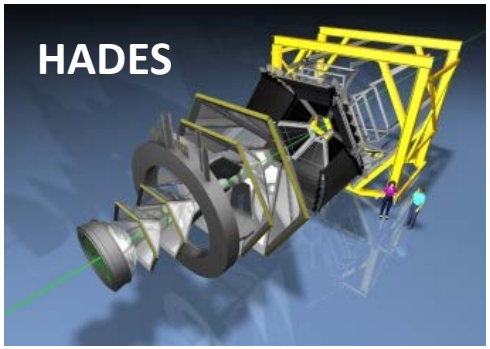
HIT Heidelberger Ionenstrahl-Therapiezentrum

heidelberg institute for radiation oncology
heidelberger Institut für Radioonkologie

DRESDEN concept

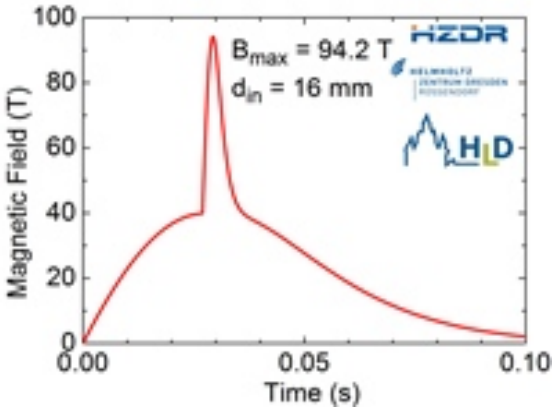
HZDR

HZDR Research Fields



Matter

- Matter and Cosmos
  Nuclear and Hadron Physics at GSI & FAIR
- Matter and Technologies
  Accelerator Research and Development
  Detector Technology and Systems
- From Matter to Materials and Life
  Structure, Dynamics and Function of Matter
  Physics and Materials Science with Ion Beams
  Research with Highest Electromagnetic Fields



Energy

- Nuclear Safety Research and Transmutation
- Matter, Energy and Resources (Ecology, Technology)
- Fluid Dynamics

Health

- Imaging and Radio-oncology: OncoRay
- Radio-pharmaceuticals
- Accelerator-based tumor therapy

OncoRay (ZIK)
National Center for Radiation Research in Oncology Dresden

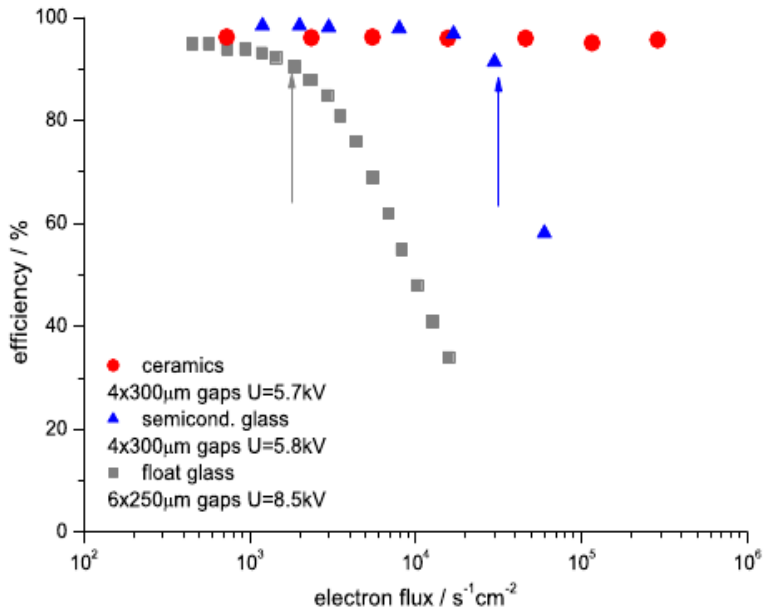
DRESDEN concept

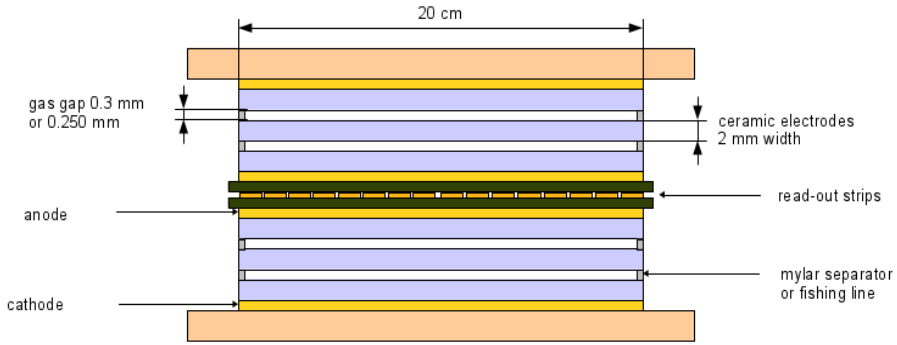
HZDR

Key Objectives: Matter and Cosmos

Detector developments for FAIR

- Large area drift chambers (HADES/CBM)
- Scintillators read out by **Silicon Photomultipliers** (NuPNET / NEDENSAA, KETEK and **HZDR Innovation GmbH**).
- Large area **resistive plate detectors** (MIPs for CBM, Neutrons for R3B) with high-rate capabilities based on ceramics (Fraunhofer IKTS-DD) tested using superconducting electron LINAC in single-electron mode

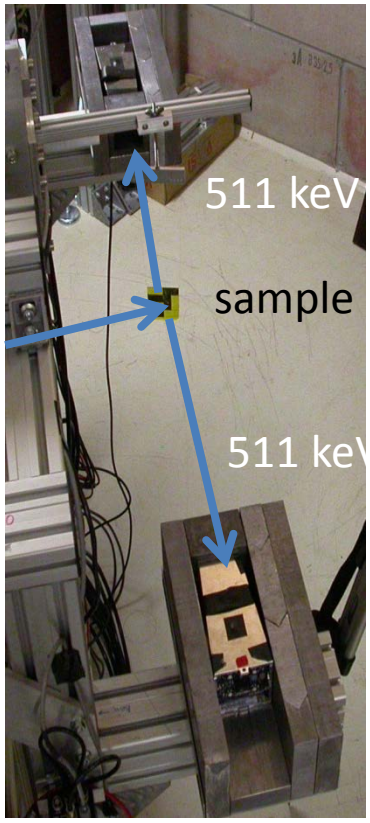


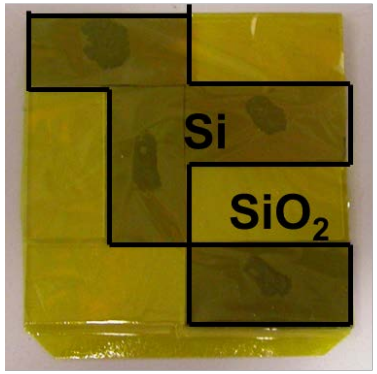


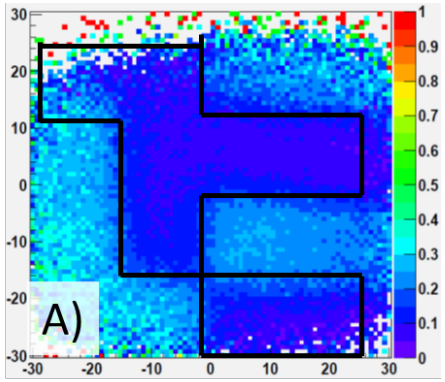
Key Objectives: Matter and Energy

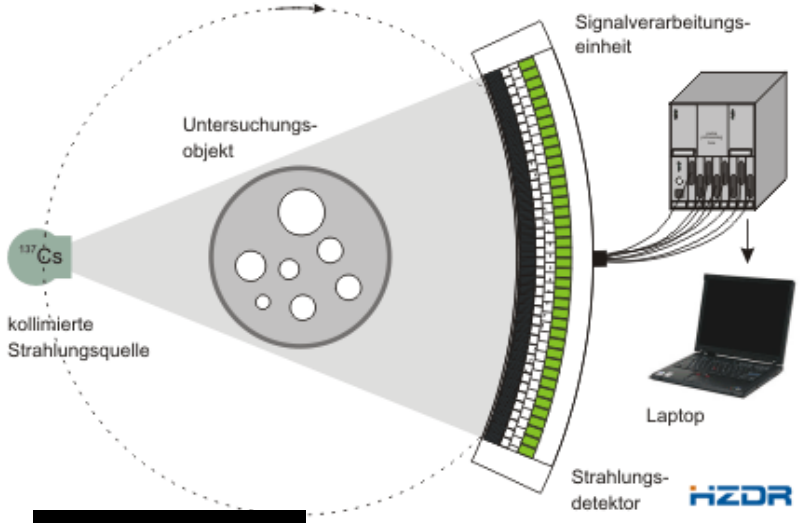
Non-destructive testing

- Fast x-ray computed tomography (ROFEX)
- Gamma-ray computed tomography (Gamma-CT)
- Position-resolved positron-annihilation lifetime spectroscopy need **fast and highly efficient scintillators and semiconductors (CZT)**.









Gamma-CT

Key Objectives: Health

Clinical prototype of a **Compton camera** for in-vivo dosimetry in proton tumor therapy, requires innovative detectors (CZT), data acquisition and image reconstruction, high-performance computing and data management through **NVIDIA CUDA Research Centre**.
New accelerator concepts (laser-particle acceleration) through HGF-**ARD** portfolio initiative.